SMELT WORKING GROUP
Monday, March 30, 2009

Recommendation for the week of March 30, 2009:

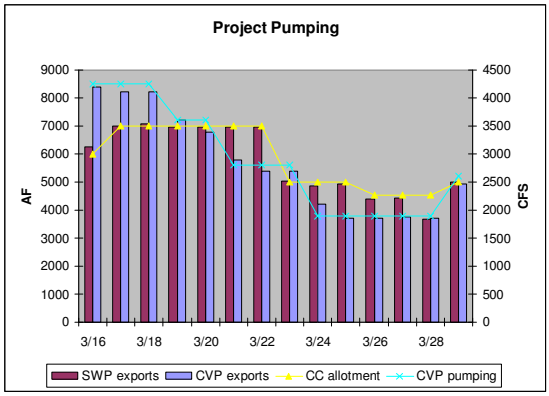
The group recommends to the Service that OMR be set at -5000 cfs on a 14-day average for the next week. The group is monitoring delta smelt salvage and will reconvene and potentially make further recommendations should a one-day, combined expanded salvage of adult delta smelt reach 20 or greater. The group also recommends that OMR be set at -4000 cfs if salvage of adult delta smelt occurs on any two consecutive days. The group also recommends that OMR be set at -2000 cfs if any salvage of larval delta smelt occurs.

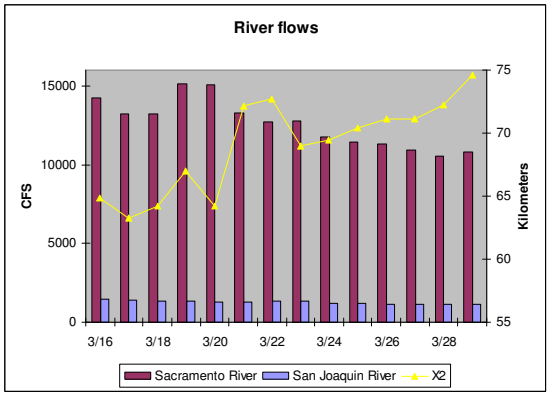
The SWG also recommends that OMR flow for the week starting April 6 should be reduced to -4,000 cfs on a 14-day average in order to protect newly spawned delta smelt. The recent Kodiak trawl survey conducted earlier this month found all adult delta smelt to be at stage 2 and 3 (not ripe). After examining these fish under the microscope, CDFG discovered that 16 of the ovaries retained hydrated, enlarged oocytes. This suggests these fish have already spawned. Water temperatures in the past two weeks and the historical relationships of delta smelt larval hatches relative to water temperature (Bennett; San Francisco Estuary and Watershed Science 2005) also suggest that spawning and hatching is imminent or has already begun. If larval delta smelt are detected at the facilities, the OMR flow should be reduced to -2,000 cfs on a 14-day average. The SWG may recommend an OMR less negative than -4000 cfs for next week based on new delta smelt data. In any case, recommended OMR flows are likely to be lower in the coming weeks to prevent larval delta smelt from becoming entrained into the south Delta.

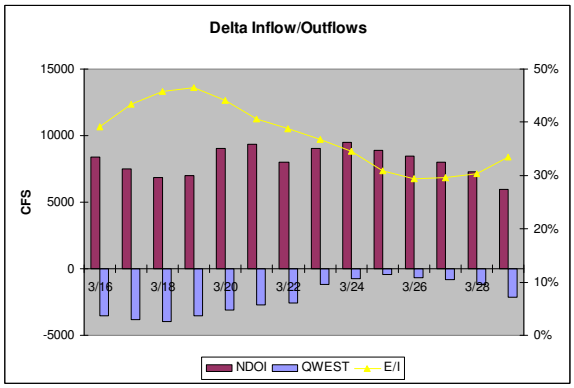
1) Current environmental data.

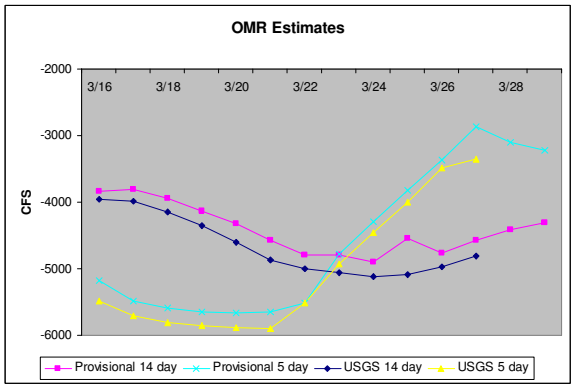
Temperature for the 3 station average is 16.1 C. The provisional OMR estimate by the projects as of March 29 is -4315 cfs for 14 day average, -3225 cfs for 5 day average. USGS OMR as of March 27 is -4811 cfs 14 day average and -3354 cfs for 5 day average. Sacramento River inflow into the Delta has been decreasing since the peak on March 5 of 46794 cfs and as of March 29 is at 10822 cfs. QWEST as of March 29 is at -2150 cfs. X2 is at 75 km as of March 29.

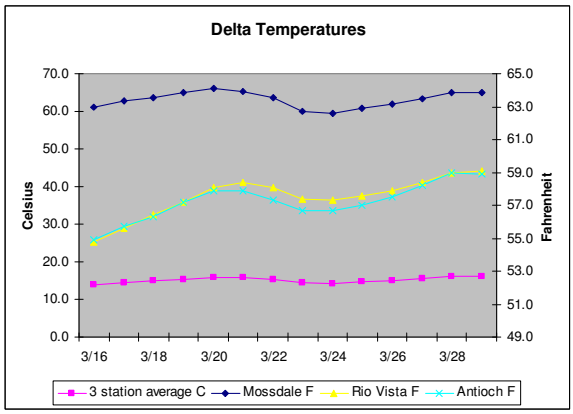
The Projects gradually dropped pumping last week to a low of approximately 4160 cfs combined pumping. As of March 29, the projects had increased pumping to approximately 5000 cfs combined. The data are depicted in the graphs below.

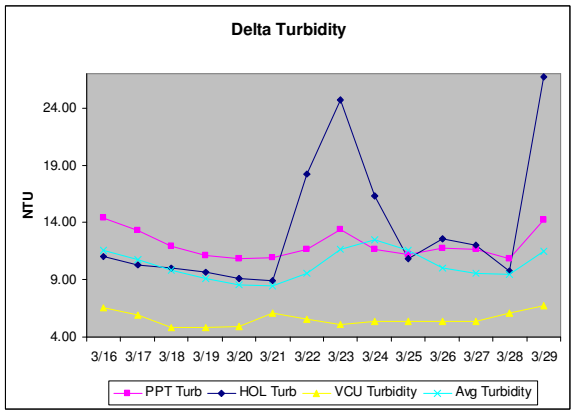












2) Delta fish monitoring:

20mm Survey #2 was completed March 27. No delta smelt larvae were detected, but a single adult delta smelt was collected incidentally in the Sacramento River Deep Water Ship Channel (SRDWSC). Longfin smelt larvae (n=3) were detected at only two locations in the central or south Delta, and processing was mostly complete for this region. Some samples are still being processed. Spring Kodiak Trawl #3 was completed March 18. Sixty-four delta smelt were collected, with the greatest number of individuals collected at station 719 (SRDWSC). Other stations where delta smelt were collected were 508, 609, 610, 716, 704, 809, 815, and 922. All 52 females were stage 2 or 3 (prespawn), however, later lab staging revealed that ovaries of 16 female retained hydrated, enlarged oocytes. This suggests these fish had already spawned. One of ten males collected was stage 5, which indicates he had spawned already. In addition to delta

smelt, 14 longfin smelt were collected at station 606, 2 at station 609, and 1 at station 501. Results from previous larval surveys and the SKT are available online at:
http://www.delta.dfg.ca.gov/data/projects/?ProjectID=SLS
http://www.delta.dfg.ca.gov/data/projects/?ProjectID=20mm
http://www.delta.dfg.ca.gov/data/projects/?ProjectID=SKT.

3) Particle Tracking Modeling

The group requested 5 PTM scenarios. Scenario A was a constant negative 5000 cfs OMR flow. Scenario B was negative 5,000 cfs OMR flow for first 7 days, followed by negative 4,000 cfs for 8 days, followed by negative 3,000 cfs for 8 days, followed by negative 2,000 cfs for 8 days. Scenario C was negative 5,000 cfs OMR flow for first 7 days, followed by negative 2500 cfs for the remaining weeks. Scenario D was negative 5000 cfs OMR flow for first 14 days, followed by negative 2500 cfs for the remaining weeks. Scenario E was a constant negative 2500 cfs OMR flow. The group requested added flux locations at or near stations 804, 809, 902, and 914 (as both input and output points). Results suggest that at constant negative 5000 cfs OMR flows, the 31-day entrainment risk for smelt larvae would be 47.5% at station 812 and 58.6% for station 815, but the ultimate fates of more than 50% of the particles would still be unaccounted for after 31 days. Particle flux past stations 902 and 914 into the south Delta suggest that eventual entrainment at the facilities might be closer to 62% and 72% for stations 812 and 815, respectively. For Scenario B, the 31-day entrainment risk for smelt larvae would be 22.0% for station 812 and 34.0% for station 815. For Scenario C, the 31-day entrainment risk for smelt larvae would be 14.6% for station 812 and 24.5% for station 815. For Scenario D, the 31-day entrainment risk for smelt larvae would be 22.2% for station 812 and 33.4% for station 815. For constant negative 2500 cfs OMR flow, the 31-day entrainment risk for smelt larvae would be 9.1% at station 812 and 19.0% for station 815. Similar to the first scenario, flux into the south Delta was 1.5 times to over 2 times greater than 31 day entrainment levels, suggesting eventual entrainment would be much higher (30% to greater than 50%) under all scenarios. Even for scenario E, south Delta flux was 24.5% for station 812 and 37.5% for station 815.

The group believes that negative 5000 cfs OMR flows is adequately protective of longfin smelt larvae already in the system, because very few remain in the central and south Delta, and that no concentration of longfin smelt in the Sacramento River was vulnerable to entrainment through Three Mile Slough at current OMR levels.

The group felt that with the current environmental conditions (and females with hydrated, enlarged oocytes from the SKT survey #2) it is likely that delta smelt have begun spawning and that larvae are in the system. Because newly hatched delta smelt larvae are too small to be captured effectively by the 20 mm survey net or observed in samples at the CVP and SWP fish facilities, larvae may be present but undetected for a few weeks.

4) Salvage

Delta smelt have been salvaged at the CVP on 2-11, 2-15, 3-1, and 3-8 and at the SWP on 3-1, 3-3, and 3-11 for a total expanded salvage of 24. Small juvenile longfin smelt were salvaged at the SWP on March 26 and the CVP on 2-27, 3-10, 3-22, 3-23, 3-24, 3-25, and 3-28 for a total

expanded salvage of 28. Larval longfin smelt were salvaged at the CVP on February 25 and 26 and March 3, 8, 10, 16, and 24 and the SWP on March 4.

5) Discussion for Recommendation

With Sacramento River inflows into the Delta at about 11000 cfs, Qwest at -2150, and X2 currently at about 75 km, the group felt OMR could be held at negative 5000 cfs primarily because of the lack of direct evidence of delta smelt hatching in the central or south Delta and limited vulnerability of longfin smelt larvae. The group recommends to the Service that OMR be set at negative 5000 cfs on a 14-day average for the week of March 30. This recommendation includes a requested change in OMR to negative 2000 cfs if any larval delta smelt are detected in salvage at either facility and to negative 4000 cfs if adult delta smelt are salvaged on two consecutive days. The group will reconvene and potentially make further recommendations should a one-day, combined expanded salvage of adult delta smelt reach 20 or greater.

With temperatures rising to 15 and 16 C, hatching has begun or will start to occur, and within 1-2 weeks some larvae might be of sufficient size to be detected in surveys. Due to the likely presence of larvae in the system by next week or the week after, if not already, the group discussed at length the potential for a new recommendation for next week. The group recommends to the Service that for the week of April 6, an OMR be set at negative 4000 cfs on a 14-day average. This recommendation may be refined further at the next Smelt Working Group meeting on April 6.

Longfin Smelt Advice

The group offers no new advice to the Department of Fish and Game regarding actions for longfin smelt. Current delta smelt advice will be protective of most longfin smelt larvae and small juveniles, the current life stages of concern.

Recent partial 20mm Survey results indicate very low densities of longfin smelt larvae in the central and south Delta, regions influenced by export pumping in the south Delta. Further, few longfin smelt larvae were present in the Sacramento River channel near Three Mile Slough to be drawn through into the central Delta by current exports. Longfin smelt larvae were transported out of the central Delta and into Suisun Bay by net westward flows in early March. Relatively little additional longfin smelt hatching has been observed or is anticipated for coming weeks, so entrainment of longfin smelt is not expected to be substantial at OMR flows of negative 5000 advised for delta smelt.